

WHAT IS CLAIMED IS:

1. A parallelism adjustment device applicable to nano-imprint lithography, the device comprising:

an imprint unit at least having a first molding plate and an imprint mold
5 mounted on the first molding plate;

a carrier unit at least having a second molding plate and a substrate mounted on the second molding plate, wherein a moldable layer is coated on the substrate;

a parallelism adjustment mechanism comprising an enclosed resilient film and a fluid filled therein, wherein the parallelism adjustment mechanism is coupled to at least
10 one of the first and second molding plates; and

a driving source for driving at least one of the imprint unit and the carrier unit, to allow the imprint mold to come into contact with the moldable layer to perform imprinting, and to allow the parallelism adjustment mechanism to be pressed via the contact between the imprint mold and the moldable layer so as to adjust parallelism for
15 the imprint mold and the substrate with respect to each other.

2. The parallelism adjustment device of claim 1, wherein the parallelism adjustment mechanism is mounted between the first molding plate and the imprint mold if the parallelism adjustment mechanism is coupled to the first molding plate, so as to adjust parallelism of the imprint mold when the parallelism adjustment mechanism is
20 pressed.

3. The parallelism adjustment device of claim 1, wherein the parallelism adjustment mechanism is mounted between the second molding plate and the substrate if the parallelism adjustment mechanism is coupled to the second molding plate, so as to

adjust parallelism of the substrate when the parallelism adjustment mechanism is pressed.

4. The parallelism adjustment device of claim 1, wherein the resilient film of the parallelism adjustment mechanism is made of one selected from the group consisting of rubber, plastic, other polymeric materials, and flexible structures.

5. The parallelism adjustment device of claim 1, wherein the parallelism adjustment mechanism further comprises a pressure sensor for sensing a pressure applied to the parallelism adjustment mechanism, so as to conduct instant pressure detection.

6. The parallelism adjustment device of claim 1, wherein a positioning platform is coupled to at least one of the imprint unit and the carrier unit, so as to facilitate positioning during imprinting.

7. The parallelism adjustment device of claim 1, wherein the driving source is a transmission unit composed of a linear motor and a hydraulic cylinder, or composed of a server motor and a ball screw rod.

8. The parallelism adjustment device of claim 1, wherein the moldable layer is made of one selected from the group consisting of a polymer, a metal, and a non-metal material.

9. The parallelism adjustment device of claim 1, wherein an anti-adhesion layer is coated over the moldable layer and the imprint mold respectively.

10. The parallelism adjustment device of claim 1, wherein the imprint mold and the substrate are mounted on the imprint unit and the carrier unit respectively by means of vacuum suction force, mechanical force, or electromagnetic force.

11. The parallelism adjustment device of claim 1, wherein a heating member is mounted on the imprint unit and the carrier unit to achieve a pre-determined operation temperature during imprinting.

12. The parallelism adjustment device of claim 1, wherein a cooling member is
5 mounted on the imprint unit and the carrier unit to achieve a pre-determined reduced temperature after imprinting.